



SARC

The Surrey Amateur Radio Club

**January
2017**

Communicator

Happy

2017

The Newsletter of the Surrey Amateur Radio Club

January 2017



Meeting Minutes

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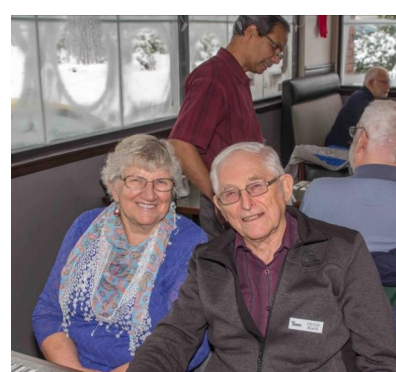
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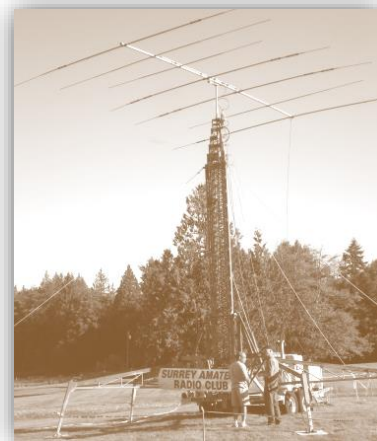
IN THIS ISSUE

click on the page number below

Last Meeting	2
Propagation Prediction	6
Ham News	9
Back To Basics	10
QRM	12
News You Can Lose	13
OTC Update	17
The Contest Contender	18
Adam's Tech Topics	22

As the last meeting was the annual SARC Christmas Party, there are no written minutes, however we do have some photos.





The **SARC Communicator** is published monthly except July and August for members of the Surrey Amateur Radio Club.

To subscribe, unsubscribe or change your address for e-mail delivery of this newsletter, notify SARCcommunicator@outlook.com

Non-members living in the Greater Vancouver area may receive one trial issue.

Beyond our membership area, annual Communicator subscriptions are available for a \$5 donation towards our Field Day fund.

SARC maintains a website at www.ve7sar.net that includes club history, meetings, news, photos and other information.

Kalmar Koffee Klatch Reminder



The SARC Weekly Koffee Klatch is on Saturday at the Kalmar Restaurant at 80th and King George Hwy in Surrey at 9:00 am. Bring your significant other, bring your family, see old friends and have fun.

On The Cover...

In the spirit of Canada's 150th birthday, we wish all of our readers a Happy New Year. May 2017 bring you good propagation and an abundance of distant QSOs.



Remember also that during 2017 you are authorized to use the special call sign prefixes to celebrate the 150th anniversary of Canada's Confederation. Amateurs and clubs whose regular call signs start with VA will be able to use the CF prefix instead of VA (for example, VA7RAC will be authorized to use the CF7RAC call sign). Amateurs and clubs whose regular call signs start with VE will be able to use the CG prefix instead of VE (e.g., VE7RAC will be authorized to use CG7RAC).



The Annual SARC Christmas Party



The Kalmar restaurant served up a great all you can eat turkey dinner. Honourary SARC member and MLA Marvin Hunt and his wife joined us.



Left: Checking those draw tickets.

The main draw prize was a dual band Alinco handheld, donated by Burnaby Radio, won by Don Dangelmaier VA7AB.

A BIG thank you to Jinty for organizing the event again this year... well done!



Check It Out

John Schouten VE7TI

RepeaterBook

Are you paying for a worldwide repeater app? There is a free alternative from ZBM2 software that bills itself as 'The World's Free Repeater App for Android and iPhone'. Just search for ZBM2 on the Android Play or Apple App Store.

With the addition of the **BlueCAT** app and interface you can also touch a RepeaterBook listing to instantly set your radio to that repeater. No more fiddling with CTCSS, frequency and offsets.

RepeaterBook - Finds repeaters across the world.

Powered by the popular community database of RepeaterBook.com and software of ZBM2.com RepeaterBook, enables you to easily find repeaters across the world, for free and without a network connection. Easily submit updates and additions from within the app. There is a database for - USA, UK, Canada, Argentina, Australia, Austria, Belarus, Belgium, Bulgaria, Brazil, Cyprus, Cayman Islands, Chile, Czech Republic, Denmark, Finland, France, Germany, Guernsey, Greece, Hungary, Iceland, India, Ireland, Isle of Man, Italy, Luxembourg, Malta, Namibia, Netherlands, New Zealand, Norway, Poland, Portugal, San Marino, Slovak Republic, South Africa, Spain, Sweden, and Switzerland.

Support for English, Argentinian, Catalan, Danish, Dutch, Finnish, French, German, Italian, Norwegian, Polish, Slovak, Spanish and Swedish languages.

I have used this app all over North America, the Caribbean and Western Europe and found it to be up to date and very useful. The interface is very intuitive. You can search for repeaters on one or more bands by city, callsign, or use the smartphone GPS to show you the repeaters in your area.

BlueCAT - Yaesu and ICOM Bluetooth CAT interfaces Versions for ICOM (7000, 7100) and Yaesu (FT-857, FT-817, FT-897, FT100D) - Touch a repeater to instantly set your radio. Use network, GPS or just enter a locator to find repeaters. No network connection required! Displays your locator and selection distance. There is a comprehensive selection, sorting and display options. The screen displays distance, heading and full repeater details. The app is fast and flexible, designed to help you use the repeater network. I've not used BlueCAT but it could be an assist to RV'ers

and off roaders who may not want to re-program their radios while on the go.

If you have any comments or questions contact them at ZBM2 or on [Facebook](https://www.facebook.com/ZBM2) for the very latest news.

And did I mention its free?

~ John VE7TI



*The World's Free
Repeater App for
Android and iPhone
or iPad*



January 2017



Propagation Prediction

Jeremy Morse VE7TMY

It's All In The Layers

You have probably heard another amateur operator mention at one time or another something about propagation being "terrible" or just the opposite, it was "excellent". What does this all really mean?

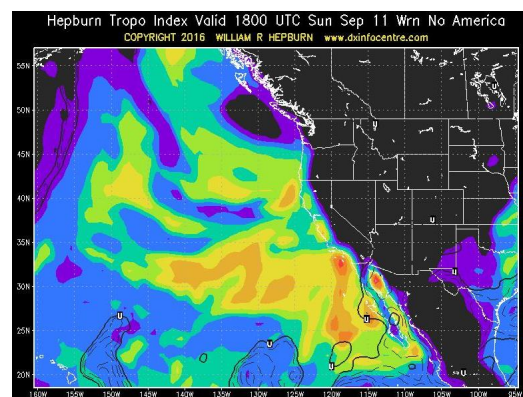
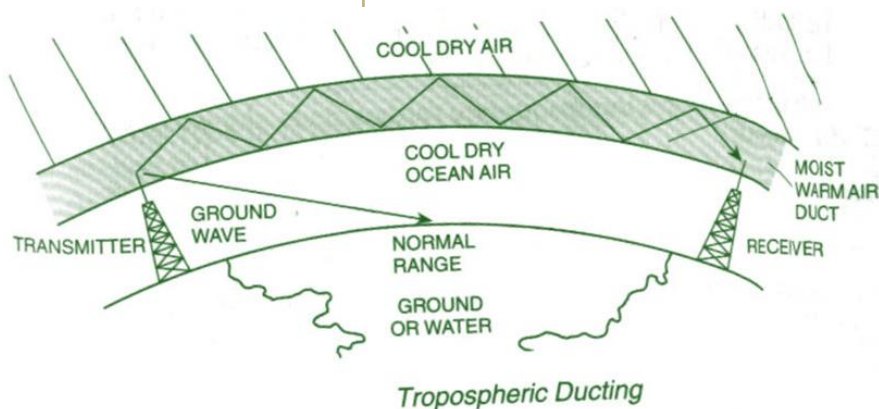
Someone told me they considered the "magic" of ham radio was the radio signal, but in my opinion the magic is really the radio wave skip propagation that allows world-wide communication without satellites.

You have probably heard another amateur operator mention at one time or another something about propagation being "terrible" or just the opposite, it was "excellent". What does this all really mean? I want to take a few minutes to revisit radio propagation outside of what can be found in the usual study guides and perhaps pique your interest in researching further on your own.

Depending on the band your using you may not even use any form of "skip" or atmospheric benefits. An example of this would be line of sight or ground waves used by VHF. Typical repeater use will all but bypass what we often think of as radio propagation. It is true that the signals are "propagating" through the air but not necessarily skipping along the atmosphere

to the benefit of either sender/receiver. Actual VHF propagation can still occur to our benefit and allow for distant radio communication in the form of tropospheric propagation and ducting. This is when under just the right weather conditions a sandwich of moist hot air is trapped between two layers of cold dry air [diagram lower left].

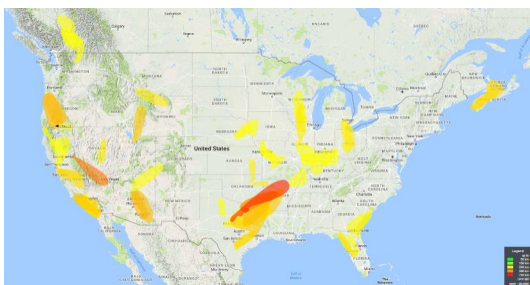
But how can we visualize VHF/UHF propagation or know when it's happening? There is a tropospheric forecast available online http://www.dxinfocentre.com/tropo_wa.html that visually shows predictions like weather charts show us hot and cold fronts and storms.



A prediction is only as good as the data the science model shows. How can it really be used by a radio operator? By noticing a storm pattern or simply that the conditions are favourable could mean it's time to experiment.

However to really visualize real time propagation reports on VHF we turn to APRS. Automatic Packet Reporting System is used by a variety of amateur radio operators to report their location and for messaging via packet radio. APRS equipped VHF radios send out beacon packets on a National frequency of 144.39 MHz and these packets include the sender's GPS location. All APRS receivers are able to read the beacon packets can record the information. Some of the receivers are Internet enabled and catalogue all the beacons to popular websites like <https://aprs.fi>. This information can then be used to show real time VHF propagation reports because we know both the sender and receiver's precise location and can calculate exactly the distance between each station.

An example of this is the website <http://aprs.mountainlake.k12.mn.us/> which adds visual aides to show the direction and distances between sites that have recently been heard.



Digital modes are far better at being received at long distances but the theory is that if packet radio is working, then voice will see a benefit as well. The contacts displayed that are yellow or red are a great

distance for VHF and not necessarily line of site. Without much elevation gain 2-way VHF is limited by the curvature of the earth. Only 6 feet above sea level antennas the distance about 3 miles. Most of the time for VHF use, one or more of the transmitters is well above 6 feet and aides in the transmission beyond the curvature of the earth.

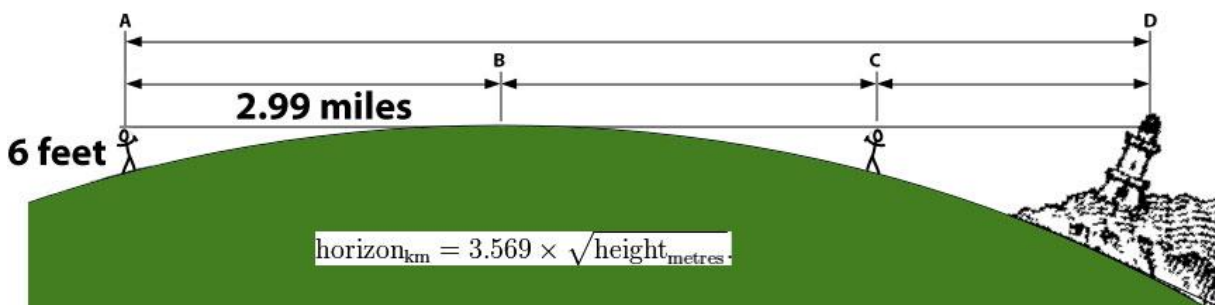
The National VHF calling frequency of 146.520 Mhz FM or 144.200 Mhz SSB can be used during times with good VHF propagation and, if conditions are right, make some very long distant contacts on 2m. The ARRL confirmed in 2015 that the VHF calling frequency could also be used for contests.

<http://www.arrl.org/news/use-of-146-52-mhz-fm-simplex-frequency-cleared-for-arrrl-contests>. This means that with the right conditions a contest on VHF could be great fun.

Larry Shaunce WD0AKX in Minnesota produced a video of VHF ducting <https://www.youtube.com/watch?v=gBJQ0Ha9ORM>

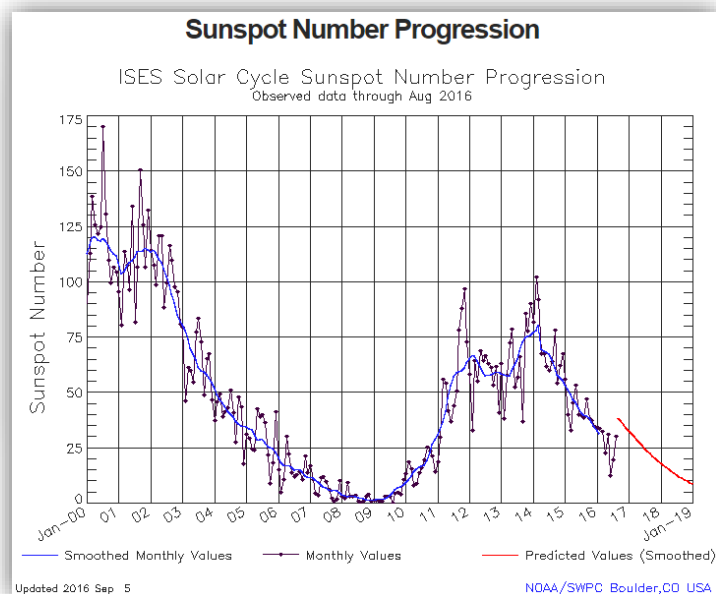
One of the first methods to help measure HF propagation is to listen on WWV. <https://www.nist.gov/time-and-frequency-services/nist-radio-stations/wwv>. This is a time and frequency checking station located near Fort Collins Colorado. It broadcasts the local time 24/7 up to 10,000 watts of power on 5, 10, 15 Mhz and 2500 watts on 2.5 and 20Mhz. One way of looking at it might be if you can't hear this station clearly it could indicate issues running QRP or 100 watts on the nearest band. It can also be used simply to test your antenna and rig since it's a strong signal running 24 hours a day.

<http://tf.nist.gov/stations/iform.html>



January 2017

Frequency	Beacon	Location
14.100	4X6TU	Israel
18.110	5Z4B	Kenya
21.150	ZS6DN	South Africa
24.930	4S7B ⁴	Sri Lanka
28.200	VR2B	Hong Kong



Unrelated to propagation, ARRL has a contest each year that contestants try to measure an exact frequency. FMT (Frequency Measuring Test) can also be used to determine propagation shifts. WWV can be used as warm up for those wanting to begin entering the FMT contest world.

<http://www.arrl.org/frequency-measuring-test>

<http://www.k5cm.com/>

Beyond the use of WWV and FMT there are the International Beacon Project. This consists of several key locations around the world each in perfect time synchronization. They rotate their signals and every few seconds a different location can be heard. All you must do is park your radio on the nearest band you wish to operate and listen. (Chart above left)

The call sign of the station is sent by CW at 100watts, then long dashes after consisting of gradually less power, 10watts, 1watt, 100milliwatts. You could somewhat predict how well propagation is on the band by listening for key stations in your region. Find it at URL:

<http://www.ncdxf.org/beacon/>

Long term predictors of radio propagation is the use of tracking space weather specifically the sunspot activity. This is an entire subject in of itself that I personally would like to learn more about.

We are entering the tail end of approximately an 11 year cycle of "good" solar activity. More on that on page 11.

<http://www.swpc.noaa.gov/products/solar-cycle-progression>

Recently I came across an article about the idea of the US Air Force wanting to spread plasma bombs in the sky to improve radio communication. Multiple research teams have been contracted to study this and the current thinking is that some form of small targeted plasma bombs in space could be used to improve radio communication. Perhaps some day we will all be looking at the targeted plasma propagation website?

<http://www.dailymail.co.uk/sciencetech/article-3753417/The-Air-Force-reveals-radical-plan-bomb-sky-improve-radio-reception.html>

~ Jeremy VE7TMY



Tidbits from the Amateur Radio World

A Sea Water Antenna

The US Navy has created a device which turns a jet of sea water into an impromptu liquid antenna, creating a powerful, high frequency broadcast tower for ships, emergency situations and easy transportation.

Created by SPAWAR System Center Pacific, the sea water antenna uses the magnetic induction properties of salt to make ordinary ocean water transmit and receive radio signals. As the pillar of water is squirted through the current probe, a magnetic field is created and signal comes through to a hooked-up communication device.

Plus, depending on the height of the stream of water, you can get UHF, VHF and HF broadcasts, all from the same jet of H₂O. You can even set up multiple jets of water, at different heights, to broadcast on different bands simultaneously. Handy.

The idea could prove particularly useful for ships, which struggle to find room for all the antennas on board. US Navy ships already have upwards of 80 antennas on deck, meaning real estate for extra towers is hugely limited. Instead, the sea water device can be placed anywhere on the deck.

The San Diego based research and development lab also argues that such an antenna could get communications back on online during natural disasters. The device can be used on land, too, to get a temporary antenna up quickly, as long as salt is added to a local water source.

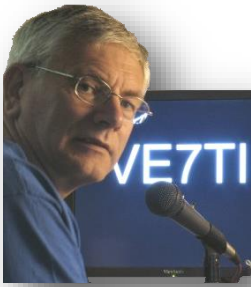


See it in action on video at URL:

<https://www.youtube.com/watch?v=9tIZUhu21sQ>



January 2017



Back to Basics

John Schouten VE7TI

From The Basic Question Bank

Radio propagation is the behavior of radio waves as they travel, or are propagated, from one point to another, or into various parts of the atmosphere.

B-007-003-002

What is the maximum distance along the Earth's surface that is *normally* covered in one hop using the F2 region?

- A. 2000 km (1250 miles)
- B. 300 km (190 miles)
- C. 4000 km (2500 miles)
- D. None, the F2 region does not support radio-wave propagation

There are at least a dozen questions in the Canadian Basic Question Bank that touch on propagation, this is just one of them. The science of RF propagation can take volumes to explain, let's see if we can summarize the basics.

Radio propagation is the behavior of radio waves as they travel, or are propagated, from one point to another, or into various parts of the atmosphere. As a form of electromagnetic radiation, like light waves, radio waves are affected by the phenomena of reflection, refraction, diffraction, absorption, polarization, and scattering.

Radio propagation is affected by the daily changes of water vapor in the troposphere and ionization in the upper atmosphere influenced by the Sun. Understanding the effects of varying conditions on radio propagation has many practical applications, from choosing frequencies for Amateur Radio contacts, to designing reliable mobile telephone systems, to radio navigation, to operation of radar systems.

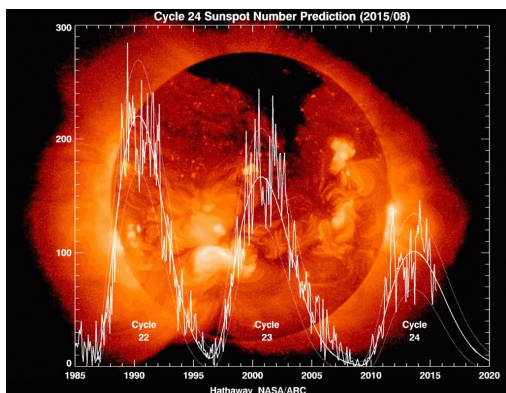
Several different types of propagation are used in practical radio transmission systems. Line-of-sight propagation means radio waves which travel in a straight line from the transmitting antenna to the receiving antenna. It does not necessarily require a cleared sight path; at lower frequencies radio waves can pass through building walls and foliage. Line of sight transmission is used in short to medium range radio transmission such as garage door openers, cell phones, cordless phones, walkie-talkies, wireless networks, FM radio and television broadcasting and radar, and satellite communication, such as satellite television. Line-of-sight transmission on the surface of the Earth is limited to the distance to the visual horizon, about 40 miles. It is the only propagation method possible at microwave frequencies and above. At microwave frequencies moisture in the atmosphere (rain fade) can degrade transmission.

At lower frequencies in the MF, LF, and VLF bands, due to diffraction radio waves, can bend over obstacles like hills, and travel beyond the horizon as surface waves which follow the contour of the Earth. These are called ground waves. AM broadcasting stations use ground waves to cover their listening areas. As the frequency gets lower the attenuation with distance decreases, so very low frequency (VLF) and extremely low frequency (ELF) ground waves can be used to communicate worldwide. VLF and ELF waves can penetrate significant distances through water and earth, and these

frequencies are used for mine communication and military communication with submerged submarines.

At medium wave and shortwave frequencies (MF and HF bands) radio waves can reflect or refract from a layer of charged particles (ions) high in the atmosphere, called the ionosphere. So radio waves transmitted at an angle into the sky can be reflected back to Earth beyond the horizon, at great distances, even transcontinental distances. This is called skywave or "skip" propagation. It is used by amateur radio operators to talk to other countries, for diplomatic communications, and by international shortwave broadcasting stations. Skywave communication is variable, dependent on conditions in the upper atmosphere, and can be disrupted by events like solar flares, it is most reliable at night and in the winter. Due to its changing nature, since the advent of communication satellites in the 1960s many long range communication needs that previously used skywaves now use satellites.

Solar activity has a cycle of approximately 11 years. During this period, sunspot activity rises to a peak and gradually falls again to a low level.



The current prediction for Sunspot Cycle 24 gave a smoothed sunspot number maximum of about 69 in the late Summer of 2013. The smoothed sunspot number reached 68.9 in August 2013, the official maximum.

We are currently over five years into Cycle 24. The current predicted and observed size makes this the smallest sunspot cycle since Cycle 14 which had a maximum of 64.2 in February of 1906.

When sunspot activity increases, the reflecting capabilities of the F1 layer surrounding earth enable high frequency short-wave communications. The highest-reflecting layer, the F2 layer, which is approximately 200 miles (320 km) above earth, receives ultraviolet radiation from the sun, causing ionization of the gases within this layer. During the daytime when sunspot activity is at a maximum, the F2 layer can become intensely ionized due to radiation from the sun. When solar activity is sufficiently high, the MUF (Maximum Usable Frequency) rises, hence the ionization density is sufficient to reflect signals well into the 30 - 50 MHz VHF spectrum. Since the MUF progressively increases, F2 reception on lower frequencies can support potential low band amateur radio paths. A rising MUF will initially affect the 27 MHz CB band, and the amateur 28 MHz 10 meter band before reaching 45-55 MHz TV and the 6 Meter amateur band. The F2 MUF generally increases at a slower rate compared to the Es MUF.

Since the height of the F2 layer is some 200 miles (320 km), it follows that single-hop F2 signals will be received at thousands rather than hundreds of miles. A single-hop F2 signal will usually be around 2,000 miles (3,200 km) minimum. **A maximum F2 single-hop can reach up to approximately 2,500 miles (4,000 km).** Multi-hop F2 propagation has enabled low-band VHF reception to over 11,000 miles (17,700 km).

The correct answer to our question therefore is (C) 4,000 Km (2,500 miles)

~ John VE7TI

"The highest reflecting layer, the F2 layer, which is approximately 200 miles (320 km) above earth..."



January 2017



QRM

...from the Editor's Shack

*Do you have a photo or bit of club news to share?
An Interesting link?*

*Something to sell or something you are looking for?
eMail it to [SARCcommunicator @ outlook.com](mailto:SARCcommunicator@outlook.com) for inclusion in this column.*

BIG Batteries

We had a donation to the Project - 48 batteries - 20+ year life - 9 years old. Each cell is 2.2 volts and a whopping 585 Amp hours. For the calculations that follow, I have rounded it down to 500 amp hours, because they have a few years on them (and the math is easier).

Each cell weights 85 pound. Six cells go into a shelf, we've stacked them 4 shelves high - so we have two stacks of four shelves. Each shelf is 12 volt and 500 amp hours. About 2000 amp hours per bank - and we have two banks. 2000 pounds per bank. Each shelf locks into the one below it, and they are bolted

together and the bottom shelf is screwed to the floor. We will add strapping to the top shelf - to hold them upright if we have an earthquake.

Somewhere in transit the flat strap connectors got lost - so we have improvised

with some other cables that we have. We are going to work on making some replacement straps. If we get them on - there are plastic covers that go over the exposed terminals. We'll have a go, likely next weekend, on putting in catastrophic fuses - right at the battery connections. We will leave them as two banks - and bring them into the main electrical room where they will each go into a A/B switch.

We have one 240 watt solar panel up - but plan to add more in the spring.

For now, we have a 40 amp Xantrex smart charger that will do multiple banks of batteries. I also have a 75 amp smart charger - just have to find it!

These are serious batteries - thought you would enjoy me sharing with you.

~ Bill VE7XS

Bill has promised a more detailed article for a future Communicator—Ed.





Page 13—News You Can Lose

The Lighter Side of Amateur Radio

Ham's Boat Anchor Won't Break Down

by K5KAC, on the scene

LONG PINE, NEBRASKA - "I guess I didn't really know what I was getting myself into," said Trey Arend, blankly staring at his Hallicrafters SR-150 as it perfectly received an 80m roundtable.

Arend bought his first Boat Anchor five years ago imagining long evenings aligning oscillators and testing tubes. "It was going to be a labor of love," he said, spinning the precision-calibrated VFO. He leans down and checks into the net, asking for a signal report. He is met with "59s" and "20 overs." He regularly hears "great audio, old man" blasting from the speaker. "Armchair copy!"

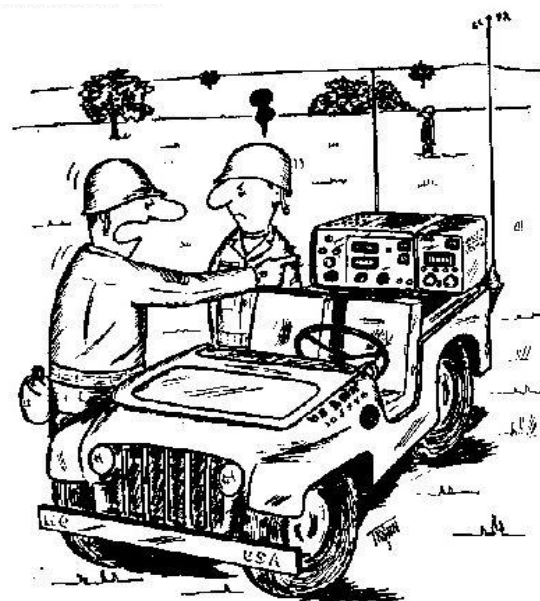
"I don't know what I am doing wrong," Arend says as he flicks off the well-grounded and regulated power supply. "I have tried

everything. Bumping the desk hard enough to knock it out of alignment; occasional coffee spills. I am at a loss."

"I bought this oscilloscope, tube tester, and digital multimeter expecting to use it," he says. Arend wipes a layer of dust from the pristine boxes. "I guess I'll mark them up a bit and try to offload them at the next hamfest."

As of press time Arend was searching classifieds for a "worked-the-last-time-I-turned-it-on" Swan 350A.

~ Ham Hijinks



"I don't care if division doesn't send QSL cards, Kolderup... GET ON THAT RADIO!"



January 2017



The Rest Of The Story...

About Hedwig Kiesler and Radio



"...her name sits on one of the most important patents ever granted by the U.S. Patent Office"

In 1933, a beautiful, young Austrian woman took off her clothes for a movie director. She ran through the woods, naked. She swam in a lake, naked. Pushing well beyond the social norms of the period.

The most popular movie in 1933 was King Kong. But everyone in Hollywood was talking about that scandalous movie with the gorgeous, young Austrian woman.

Louis B. Mayer, of the giant studio MGM, said she was the most beautiful woman in the world. The film was banned practically everywhere, which of course made it even more popular and valuable. Mussolini reportedly refused to sell his copy at any price.

The star of the film, called Ecstasy, was Hedwig Kiesler. She said the secret of her beauty was "to stand there and look stupid." In reality, Kiesler was anything but stupid. She was a genius. She'd grown up as the only child of a prominent Jewish banker. She was a math prodigy. She excelled at science. As she grew older, she became ruthless, using all the power her body and mind gave her.

Between the sexual roles she played, her tremendous beauty, and the power of her intellect, Kiesler would confound the men in her life including her six husbands, two of the most ruthless dictators of the 20th century, and one of the greatest movie producers in history.

Her beauty made her rich for a time. She is said to have made - and spent - \$30 million in her life. But her greatest accomplishment resulted from her intellect, and her invention continues to shape the world we live in today.

You see, this young Austrian starlet would take one of the most valuable technologies ever developed right from under Hitler's nose. After fleeing to America, she not only became a major Hollywood star, her name sits on one of the most important patents ever granted by the U.S. Patent Office.

Today, when you use your cell phone or, over the next few years, as you experience super-fast wireless Internet access (via something called "long-term evolution" or "LTE" technology), you'll be using an extension of the technology a 20-year-old actress first conceived while sitting at dinner with Hitler. At the time she made Ecstasy, Kiesler was married to one of the richest men in Austria. Friedrich Mandl was Austria's leading arms maker. His firm would become a key supplier to the Nazis.

Mandl used his beautiful young wife as a showpiece at important business dinners

with representatives of the Austrian, Italian, and German fascist forces. One of Mandl's favorite topics at these gatherings - which included meals with Hitler and Mussolini - was the technology surrounding radio-controlled missiles and torpedoes.

Wireless weapons offered far greater ranges than the wire-controlled alternatives that prevailed at the time. Kiesler sat through these dinners "looking stupid," while absorbing everything she heard.

As a Jew, Kiesler hated the Nazis. She abhorred her husband's business ambitions. Mandl responded to his willful wife by imprisoning her in his castle, Schloss Schwarzenau.

In 1937, she managed to escape. She drugged her maid, snuck out of the castle wearing the maid's clothes and sold her jewelry to finance a trip to London.

She got out just in time. In 1938, Germany annexed Austria. The Nazis seized Mandl's factory. He was half Jewish. Mandl fled to Brazil. Later, he became an adviser to Argentina's iconic populist president, Juan Peron.

In London, Kiesler arranged a meeting with Louis B. Mayer. She signed a long-term contract with him, becoming one of MGM's biggest stars. She appeared in more than 20 films. She was a co-star to Clark Gable, Judy Garland, and even Bob Hope. Each of her first seven MGM movies was a blockbuster.

But Kiesler cared far more about fighting the Nazis than about making movies. At the height of her fame, in 1942, she developed a new kind of communications system, optimized for sending coded messages that couldn't be "jammed." She was building a system that would allow torpedoes and guided bombs to always reach their targets. She was building a system to kill Nazis.

By the 1940s, both the Nazis and the Allied forces were using the kind of single-frequency radio-controlled technology

Kiesler's ex-husband had been peddling. The drawback of this technology was that the enemy could find the appropriate frequency and "jam" or intercept the signal, thereby interfering with the missile's intended path. Kiesler's key innovation was to "change the channel." It was a way of encoding a message across a broad area of the wireless spectrum. If one part of the spectrum was jammed, the message would still get through on one of the other frequencies being used. The problem was, she could not figure out how to synchronize the frequency changes on both the receiver and the transmitter. To solve the problem, she turned to perhaps the world's first techno-musician, George Anthiel.

Anthiel was an acquaintance of Kiesler who achieved some notoriety for creating intricate musical compositions. He synchronized his melodies across twelve player pianos, producing stereophonic sounds no one had ever heard before. Kiesler incorporated Anthiel's technology for synchronizing his player pianos. Then, she was able to synchronize the frequency changes between a weapon's receiver and its transmitter. On August 11, 1942, U.S. Patent No. 2,292,387 was granted to Anthiel and "Hedy Kiesler Markey," which was Kiesler's married name at the time.

Most of you won't recognize the name Kiesler. And no one would remember the name Hedy Markey. But it's a fair bet that any reader of a certain age will remember one of the great beauties of Hollywood's golden age - Hedy Lamarr.

That's the name Louis B. Mayer gave to his prize actress. That's the name his movie company made famous.

Meanwhile, almost no one knows Hedwig Kiesler - aka Hedy Lamarr - was one of the great pioneers of wireless communications. Her technology was refined by the U.S. Navy, which has used it ever since. You are probably using Lamarr's technology, too. Her patent sits at the foundation of "spread spectrum



Kiesler's partner the world's first techno-musician, George Anthiel

she developed a new kind of communications system, optimized for sending coded messages that couldn't be "jammed."

January 2017

Check out this CBS News featurette on 'the other side' of Hedy Lamarr.

<https://www.youtube.com/watch?v=35-KOR-x94g>

technology," which you use every day when you log on to a wi-fi network or make calls with your Bluetooth-enabled phone. It lies at the heart of the massive investments being made right now in so-called fourth-generation "LTE" wireless technology. This next generation of cell phones and cell towers will provide tremendous increases to wireless network speed and quality, by spreading wireless signals across the entire available spectrum. This kind of encoding is only possible using the kind of frequency switching that Hedwig Kiesler invented.

And now you know the rest of the story.

~ With thanks to
Dixie Mogg VA7DIX



UNITED STATES PATENT OFFICE

2,292,387

SECRET COMMUNICATION SYSTEM

Hedy Kiesler Markey, Los Angeles, and George Anthell, Manhattan Beach, Calif.

Application June 10, 1941, Serial No. 397,412

6 Claims. (Cl. 250-2)

This invention relates broadly to secret communication systems involving the use of carrier waves of different frequencies, and is especially useful in the remote control of dirigible craft, such as torpedoes.

An object of the invention is to provide a method of secret communication which is relatively simple and reliable in operation, but at the same time is difficult to discover or decipher.

Briefly, our system as adapted for radio control of a remote craft, employs a pair of synchronous records, one at the transmitting station and one at the receiving station, which change the tuning of the transmitting and receiving apparatus from time to time, so that without knowledge of the records an enemy would be unable to determine at what frequency a controlling impulse would be sent. Furthermore, we contemplate employing records of the type used for many years in player pianos, and which consist of long rolls of paper having perforations variously positioned in a plurality of longitudinal rows along the records. In a conventional player piano record there may be 88 rows of perforations, and in our system such a record would permit the use of 88 different carrier frequencies, from one to another of which both the transmitting and receiving station would be changed at intervals. Furthermore, records of the type described can be made of substantial length and may be driven slow or fast. This makes it possible for a pair of records, one at the transmitting station and one at the receiving station, to run for a length of time ample for the remote control of a device such as a torpedo.

Fig. 2 is a schematic diagram of the apparatus at a receiving station;

Fig. 3 is a schematic diagram illustrating a starting circuit for starting the motors at the transmitting and receiving stations simultaneously;

Fig. 4 is a plan view of a section of a record strip that may be employed;

Fig. 5 is a detail cross section through a record-responsive switching mechanism employed in the invention;

Fig. 6 is a sectional view at right angles to the view of Fig. 5 and taken substantially in the plane VI—VI of Fig. 5, but showing the record strip in a different longitudinal position; and

Fig. 7 is a diagram in plan illustrating how the course of a torpedo may be changed in accordance with the invention.

Referring first to Fig. 7, there is disclosed a mother ship 10 which at the beginning of operations occupies the position 10a and at the end of the operations occupies the position 10b. This mother ship discharges a torpedo 11 that travels successively along different paths 12, 13, 14, 15 and 16 to strike an enemy ship 17, which initially occupies the position 17a but which has moved into the position 17b at the time it is struck by the torpedo 11. According to its original course, the enemy ship 17 would have reached the position 17c, but it changed its course following the firing of the torpedo, in an attempt to evade the torpedo.

In accordance with the present invention, the torpedo 11 can be steered from the mother ship 10a and its course changed from time to time as necessary to cause it to strike its target. In



Operational Training Centre Update

John Brodie VA7XB

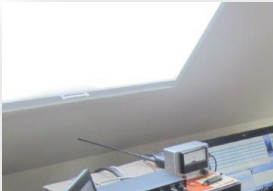
RAC Winter Contest Dec 17, 2016

Things did not start off well. A plan to operate this contest from the OTC failed to materialize because the recent windstorms had caused the coax to wrap around the mast and when attempts were made to raise the tower, the coax jammed and the connector pulled loose. So instead, the event took place at a member's station, who himself handicapped the effort by neglecting to fully raise the tower before the contest. So all contacts were made with the beam at only 30 ft. above ground. Further, the 80 m wire had not been repaired after a windstorm had knocked it down so this band was not available.

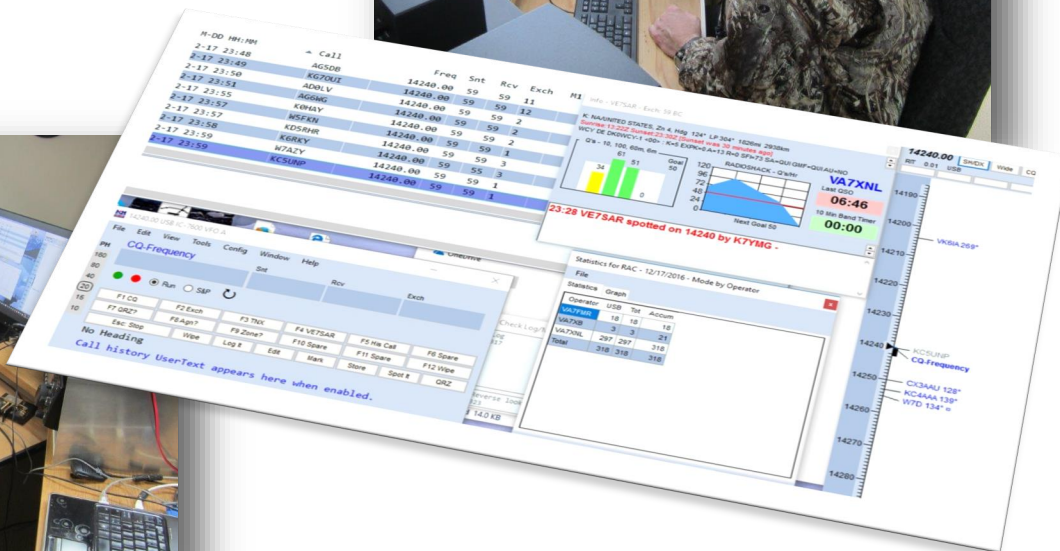
Nevertheless, in about 5 operating hours, 318 SSB contacts were made, most of them by Sheldon VE7XNL who was able to cope with several hours of pileup without a break. First-time contestant, Robert VA7FMR, took the first 2-hour shift and got some practice in search & pounce by

copying and logging callsigns and the exchange before making the contact.

This was a confidence-building exercise, not a serious competitive effort but it was enjoyed by all. Full power of 750 watts was used to ensure a successful experience, which helped compensate for the compromised antenna. The next must-do contest is the BC QSO Party on Feb 4/5, and we will have to make sure that we are fully prepared to show the SARC flag.



~ John VA7XB



January 2017



The Contest Contender

Fred Orsetti VE7IO

2016 RAC WINTER CONTEST USING VE7RAC @ VE7IO



Again we were fortunate to have the use of VE7RAC for the winter contest and because it is a 20 point contact, plus being a multiplier, we are more in demand. Right now with band conditions being in the doldrums being a bonus contact is a big help.

We had a serious noise issue with 80 meter phone which made it unusable early in the evening. The noise was +10db over 9 so the only stations we could hear were the ones close by. Later in the evening the noise dropped off and we were able to work a few stations on CW.

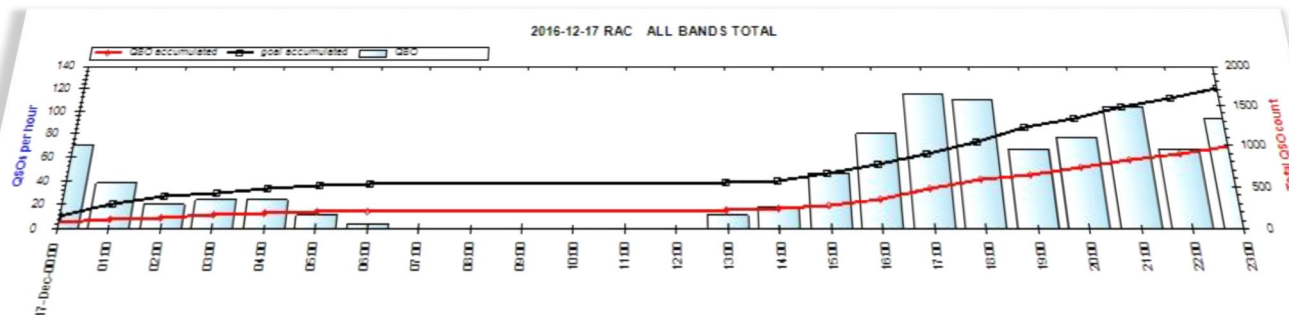
Below is a graph showing our score this year, in red, and last year in black.

Our team being made up of 2 YL's and 3

OM's was a very good mix. YL's operating SSB, as it has been said many times, have an advantage when in the "run" mode. So just like every other contest we have operated from here at IO the YL's stole the show.

For the CW operators the bands were quite good at times. As you can see from the above score summary 40 was our best CW band. This may have been due to the loss of the tri-band beam early in the contest. The beam problem seems to be related to a failed connector at the top of the tower so we are waiting for a good day to check it out. That said, the majority of the 40 meter Q's were made with a dipole at about 30 feet, not too bad. It shows that if the bands are open you can do well with a minimal antenna.

At the time of this writing we are in second place in Canada which only has a slim chance of holding up but we will hope for the best.



Our next events will be the BCQP contest in February then we get into our week of the use of VE100VIMY/ve7 also in February. We have booked time for operating VE100VIMY/ve7 from IO on February 18th, this is not a contest.

~ Fred VE7IO



Call: VE7RAC
Operator(s): VE7IO VA7NF
VA7NLF VA7QD VE7BC
Station: VE7IO
Class: M/M HP
QTH: Surrey BC
Operating Time: 17 hrs

Summary:

Band	CW Qs	Ph Qs	CW Muts	Ph Muts
160:	0	0	0	0
80:	69	8	8	2
40:	243	19	9	5
20:	187	427	11	12
15:	20	4	2	1
10:	0	0	0	0
6:	0	0	0	0
2:	0	0	0	0

Total: 519 458 30 20
Total Score = 227,200

Get ready for what is probably the easiest contest to work from our area. The BC QSO Party is just a few weeks away.



Next running of the BCQP: 1600z February 4 to 0400z February 5, 2017

Suggested frequencies:

Band	Freq. (Khz)	Band	Freq. (Khz)
160M CW	1815	160M PH	1845
80M CW *	3585	80M PH	3850
40M CW *	7035	40M PH	7230
20M CW *	14035	20M PH	14250
15M CW	21035	15M PH	21300
10M CW	28035	10M PH	28490
* CW after 0000z consider 3570, 7070 and 14050 (due to NA Sprint CW activity)			

January 2017



The SEPAR Report

Roger Andrews VA7VH

Historical weather data proves that a damaging storm is not an impossibility for us.

Hello everyone,

Well, we have had some winter weather this year in the form of snow. Some neighbourhoods in Metro Vancouver and the Fraser Valley had more than others. The snow made me think about weather records and snowfall in previous years, and how we cope.

We can't complain too much about the relative small amount we have received, so far this year. In comparison on April 14, 1921 Silver Lake Colorado (just west of Denver) set a world record for continuous snowfall. 193 mm (over 6 feet) fell in 24 hours. But the storm didn't stop there. It carried on for a full 32.5 hours, leaving a total of 241.3 cm (8 feet) of snow. I have been heard complaining about clearing just several inches!

In Cloverdale so far this December (as of December 18th), we have only had 26.6 cm (10 inches). It is however, snowing as I write this and at least in Fraser Heights, you can add at least another 4

inches (10 cm) to that. This isn't a record by any means but, we have had winters in the past that did make it into the record books.

In 2008 we had a series of snowstorms that broke a 44 year record. By the time it was all over some areas saw accumulations of up to 91.4 cm (3 feet) of snow. I'm in Fraser Heights and we easily saw that much. Only large vehicles with chains were able to get on and off our street at one point.

"Victoria's Snowstorms of the Century - February 2, 1916 and December 28-29, 1996. Huge snowstorms, 80 years apart, clobbered Canada's "snow-free" city with more than 55 cm of snow. The December storm dropped 80 cm of snow in 24 hours, 125 cm in five days with cleanup costs exceeding \$200 million (including a record insurance payout for BC of \$80 million)." -Environment Canada.

In 1935 "Cold Wave Freezes Victoria and BC's Lower Mainland - January 19-29, 1935. Winter weather gripped Vancouver, with temperatures dipping to -16° and snowfall greater than 40 cm (15 inches). While the extreme cold caused fuel shortages and frozen water supplies, a quick thaw followed by 267 mm (10.5 inches) of rain over the next four days added extensive roof damage across the city, including the collapse of the Forum -- the city's main hockey and curling rink." -Environment Canada.



Surrey Emergency Program Amateur Radio

On October 12, 1962 remnants of typhoon Freda hit BC's Lower Mainland killing 7 people and causing greater than \$10 million in damages. Damage to Stanley park was excessive, covering 20% of the park. The media seems to have forgotten about that one and only ever references the 2006 storm. In fact the 1962 storm was almost twice as damaging to the park (about 81 hectares damaged in 1962 vs only 41 hectares in 2006).

Coming forward to today, our recent, relatively minor, weather event reminds us that it doesn't take a lot to bring the region to a slow down. A little bit of snow and traffic is a mess, it takes longer to get to where you are going, and events are cancelled. It wouldn't take much more snow to bring the area to a stand still. We have had significant events in the past and, we will have them again.

The City of Surrey's disaster plan acknowledges that the most likely scenario for a disaster, in this region, is a deep freeze with a power outage. One might be inclined to think "Sure, I have seen west coast winter weather before, and it never gets bad enough to be concerned about." Well...that is just not true! It has gotten bad in the past. Also, Environment Canada has stated that changing weather patterns caused by global warming make it likely that we will see many more unusual weather events.

Historical weather data proves that a damaging storm is not an impossibility for us. With weather patterns changing then so should the attitude that it will never get bad here. Let's not be caught out in the cold! (Sorry for the pun.)

On the lighter side while researching for this article I discovered an interesting fact. On September 8, 1954, Percy Saltzman, a meteorologist was the first person to be broadcast on

Canadian television. He continued to present the weather on TV for 22 years. I guess weather is pretty important to us Canadians.

Every Tuesday evening at 1930 hrs (7:30pm PDT) we start a ½ hour NET on a local repeater provided by the Surrey Amateur Radio Club (SARC) on 147.360 MHz +600kHz and a tone of 110.9.

There may be a simplex test or a test NTS message transmitted during the NET at the Net controllers discretion.

This is an excellent opportunity to practice sending and receiving this form of messaging. Besides, it adds a little spice to the regular check-ins on the net. Please join us. NTS Radiograms can be found on the SEPAR website.

Thursday nights at 19:30 hours, we only provide Simplex operations starting on frequency 146.550 and changing frequencies and bands for further signal checking. During these tests, we encourage those with mobile or hand held capabilities to try different locations each time to become more knowledgeable as to what to expect in a real disaster. We are unable to predict where we will be located when we are needed. Additional training sessions and practice exercises are scheduled throughout the year including participation with other departments and agencies. Also a good opportunity to practice being net control.

Looking for a challenge? SEPAR is still looking for more net controllers, be it for the Tuesday night net and/or for an emergency event. If you can't commit to doing weekly Net Control then it may be possible to do an occasional one. Contact me at this email address if you are interested.

73

~ Roger VA7VH

"...the most likely scenario for a disaster, in this region, is a deep freeze with a power outage"

January 2017



Adam's Tech Topics

Adam Foley N1RKW

The Heathkit 'Battery Eliminator'

To quote Jeremy Clarkson, "More power!"

Hello and welcome to another new year, same as the old year. This is the 4th year I've been writing this series of articles, and I'm still enjoying the process of writing them. Even more than that, I enjoy the positive feedback I receive from those of you who read them. Thank you!

While trying to come up with a good idea for this month's article, I found myself at the bench working on a project. Every now and then we all run across something that beats us, something that no matter how much effort we put in just doesn't work. Something that we spend hours lovingly crafting and then want to chuck out the window and into the nearest dumpster. Something that should be simple and relatively easy and yet somehow taxes our mind to its fullest limits and still stubbornly refuses to work properly.

Meet my nemesis:

This is the Heathkit IP-2715 "Battery Eliminator". It is really nothing more than a honkin' big power supply made by Heathkit sometime round about 1980-ish, probably intended to power things that

would otherwise need large 6 or 12 volt batteries. This particular one was given to me by a friend who shall remain nameless and blameless for the purposes of this article. It was given to me in perfectly good condition, other than a small layer of dust. It's a very stonky and massive thing for a consumer power supply, capable of supplying 20 amps of current across its entire voltage range of 6

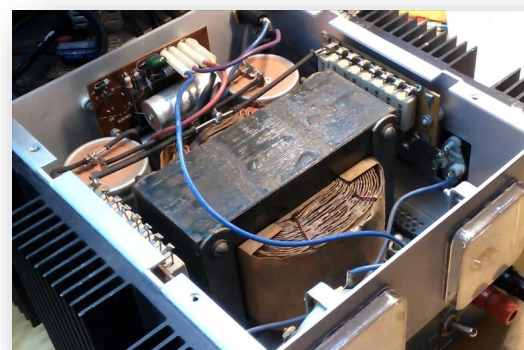
to 16 volts. That's a lot of power, but there is one slight problem: the narrow voltage adjustment range.

I want more!

To quote Jeremy Clarkson, "More power!"

I want a wider voltage range, which means that the problem is actually with me instead of the equipment. I have a need (okay, want) for a strong power supply with a range of 0 to 30 volts. The Heathkit, while perfectly functional within the limits of its original design, just wouldn't cover the range I needed (wanted).

So I did what any good hacker would do, I broke out the screwdriver and had a look under the hood. This is what I saw:



Yes, that transformer really is as mahoosive as it looks. It's a real monster, as anyone who has ever had to lift one of these giant chunks of iron can attest. Good! That means that Heathkit wasn't slacking when they put the thing together. It may be rated for 20 amps, but the only thing stopping it from briefly putting out much, much more is the 20 amp rated output fuse.



Gooooood.

That means that it won't complain in the least when asked to put out a lot more power than originally intended.

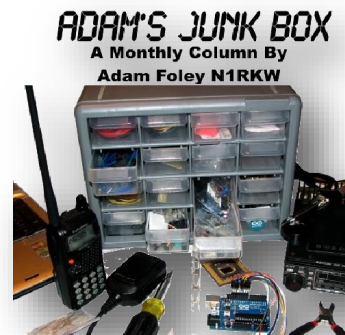
Let's take a break from drooling over the massive chunk of iron and copper that is the heart of my Heathkit and talk about power for a moment, or more accurately, for a paragraph. Electrical power is, by definition, *"the rate, per unit time, at which electrical energy is transferred by an electric circuit,"* according to Wikipedia. In other words, it's a measure of how much electricity is being used. It's measured in watts, and watts can be determined simply by multiplying the voltage supplied by the current drawn (not taking into account various things like power factor or frequency which are specific to certain situations). So if you have a circuit drawing 1 amp with a 120 volt supply, you are using 120 watts of power ("watts of power" is a redundant statement, according to the Redundant Department of Redundancy Department). Another example would be if you were drawing 5 amps at 5 volts, you would be using 25 watts. Here's where this discussion starts to apply to the overall article: Take that same 5 amp load up to 20 volts and all of the sudden you're using 100 watts instead of 25! You've quadrupled the amount of power while drawing the very same amount of current. That power not only represents the amount of work that electricity can do, it also represents the amount of power being run through your wires and other components in whatever system you're using. In the case of my power supply, it is rated for a maximum of 20 amps at 16 volts, which is 320 watts. While this is a significant amount of power, and the supply is certainly robust enough to handle that and then some, if I crank it up to 11, I mean 30 volts, and ask it to deliver all 20 of those amperes, it will be cranking out a whopping 600 watts! That's almost double what it's rated for, and certainly enough to cause some components to fail. By fail, I mean go up in flames or even explode. Boom.

Fortunately, the giant lump of iron that is the transformer powering this power supply puts out at most 28 volts after

rectification (turning AC to DC). After the voltage losses from the various components within the supply, this amounts to an output voltage no higher than 24 volts. That means that the most I can possibly ask from the supply is a slightly less insane 480 watts, which it should be able to handle due to the fact that it is significantly overbuilt. However, this may be true of this particular power supply, but it will not be true of most other supplies. In fact, most are built down to a price and are therefore not sturdy enough to tolerate these kinds of modifications without significant redesigns, which would probably end up being more expensive than simply obtaining the correct type of power supply in the first place. If you double the power of the engine in your car, something's going to break, and do so very expensively. The same is true of power supplies, only instead of leaving you on the side of the road with a towing bill, they will leave you with no eyebrows and an electrical fire to contend with.

I also need to include the obligatory warning about not messing with line level power as it is very dangerous to do so. Safety first. Do not try this at home. Frost heaves ahead. Always wear safety glasses. Always wear proper protective equipment. Don't panic. Do not eat live wires. Do not attempt to do this unsupervised. Safety third. Please use caution. Do not look into laser with remaining eye. Please obey all road signs and local laws. You have been warned.

Now that we've got that silliness out of the way, let's take a look at the power supply and the changes that we need to make in order to make it play the way I want it to. The power supply is controlled by a device called a voltage regulator. In this case, that device is a



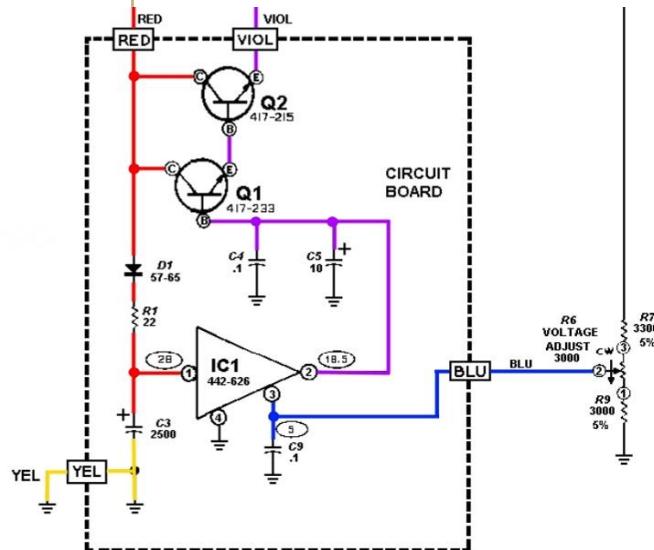
Guest Columnist Adam Foley N1RKW is a member of the Central New Hampshire Amateur Radio Club and contributes a monthly column "Adam's Junk Box" to their newsletter, also called The Communicator.

Adam also has a [YouTube Channel](#)

January 2017

"The power supply is controlled by a device called a voltage regulator"

Heathkit # 442-626, which translates to a Fairchild μ A78MG chip. Heathkit has their own weird part numbering system, so cross referencing to find out what it is you're actually dealing with is often necessary. This particular chip was apparently popular in the 1970s but hasn't been available on the market for quite some time, so finding a way to replace it with something obtainable is probably a good idea anyway (the regulator chip is quite often the weak point in power supplies). It is this chip, along with some external components, that has the job of determining the output voltage of the power supply. In other words, it's that little bugger that's holding me back!



This is the portion of the power supply's schematic that we are most concerned with: the regulator board. In case reading schematic diagrams isn't your thing, I'll do my best to explain. On the left side there is a red wire coming into the board. This is the positive input to the regulator, in other words it's how the power from the transformer gets to the voltage regulator chip. Negative, aka ground is attached to the board via the yellow wire in the lower left.

Quick note for anyone worrying that I've got my DC backwards: I'm using conventional current flow here for

simplicity's sake, not electron flow. It's easier to explain that way. Who needs science anyway?

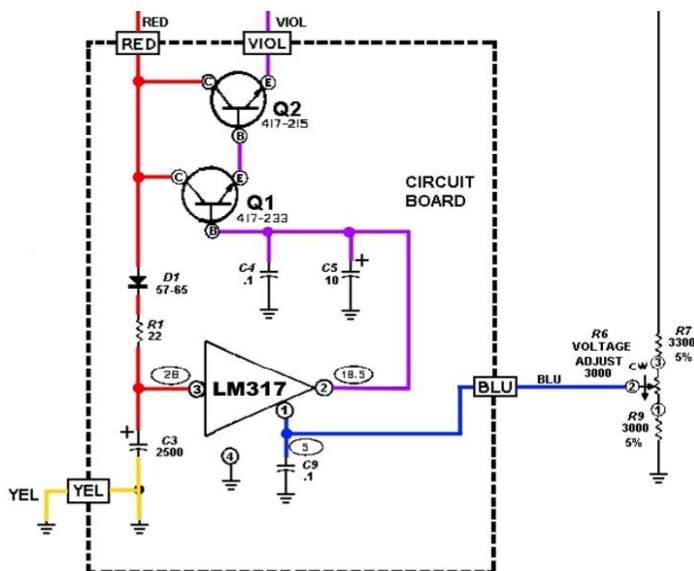
The blue wire on the right goes to the potentiometer (a variable resistor) which provides the adjustment for the regulator chip. This is what the knob on the front panel of the power supply is connected to. Finally, the output voltage goes out through the purple wire (okay, violet) to transistors Q1 and Q2, which function as buffers to increase the available current. From there it goes off to four big power transistors elsewhere in the power supply which have the job of making a large amount of current available at the power output jacks on the front panel. All the other components shown on the board have small jobs that we don't need to worry about here.

The function of IC1, the μ A78MG voltage regulator chip, is to regulate voltage. If that sounds obvious, it's because it is. It adjusts its output voltage according to the voltage it is seeing on pin 3 via the blue wire. It's that simple, really. Power in, ground, adjustment potentiometer, and power out. What could possibly go wrong?

After fumbling around online, I learned that I'm not the only person on the planet that owns a Heathkit IP-2715 power supply. Furthermore, I'm not the only one foolish enough to attempt to modify it. One person reported in a forum that he had good luck replacing the μ A78MG with an LM317 variable voltage regulator chip. The LM317 is an old but excellent chip with just three leads: Input, Adjust, and Output. That's even simpler than the other one! The 317 is also available all over the place for very little money, including places like Digikey, Mouser, eBay, and Adam's Junk Box. That last one is especially handy for me, of course.

Naturally, being the kind of guy that rushes into things without thinking them through properly, I immediately desoldered the original regulator chip and soldered the 317 in its place, ignoring the ground lead which isn't needed with the LM317.

Here's what that looks like on the schematic:

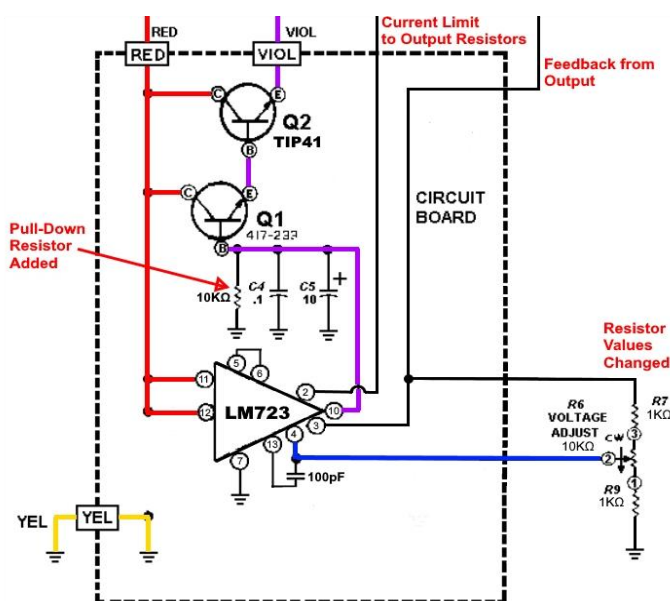


Would you believe that it actually worked? I got a whopping voltage range of 5v to 18v.

Not quite what I was looking for...

The fix for this would have been quite easy, but I naturally went back to the drawing board rather than try to repair the minor issues with that particular setup. I picked an LM723 chip out of my junk bins and attempted to make use of that instead. This is another old but good voltage regulator chip that's still available and in common usage. In fact, if you have an Astron linear power supply, you probably have an LM723. People have been using these chips in commercial and homemade power supplies for well over 40 years. It can't be that hard to figure out, right?

I thought so too, but I was failing to take into account my personal inability to actually figure anything useful out. Here is what I came up with, after several iterations [right]:



As you can see, I made a lot of changes in order to accommodate that 723 chip. Fortunately, it worked. Unfortunately, due to a design quirk of the 723 multiplied by my lack of knowledge about them, the voltage range ended up only being from 7v to 24v, and even then only after more tinkering to get some resistor values right in the adjustment part of the circuit. I also had to add a pull-down resistor between the 723's output and ground in order to make it adjustable down as well as up. That one took a while to figure out, with a lot of head-scratching involved.

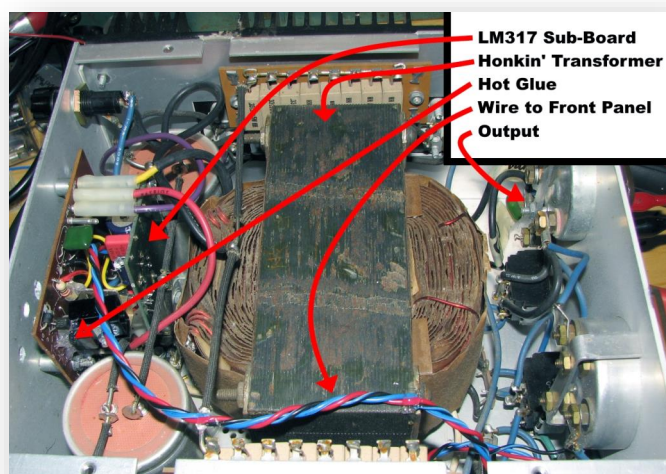
I spent the better part of a week trying to figure out a good way to make the 723 work across the full range I wanted, including working up another completely different iteration of the 723 circuit. I'm certain that some of you reading this are probably shouting at me right now for not figuring this out, but I genuinely couldn't wrap my head around it. I'll spare you the details of all my stupid mistakes, but suffice it to say that I only made things worse with each iteration.

Eventually, I was left with two possible solutions: I could leave the LM723 circuit in place, going back to the first iteration that actually worked, and have a regulated power supply that was only functional from 7 to 24 volts, or I could put the LM317 circuit back in and have an unregulated power supply that worked well from 0 to 24 volts.

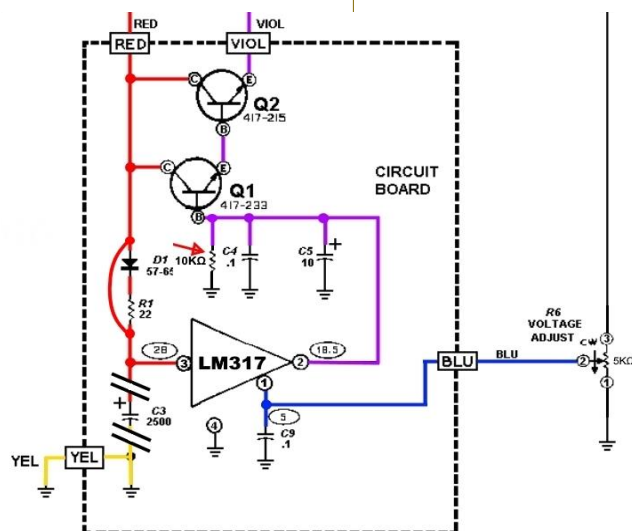
When talking about power supplies, the word "regulation" refers to the ability of the power supply to maintain a specific voltage output regardless of the load being placed on it. For instance, a ham radio power supply that maintains 13.8 volts even while you are transmitting at 100 watts could be said to have good regulation. An unregulated power supply will not automatically compensate for the load placed on it, so the output voltage will drop proportionally with the amount of load and may need to be adjusted manually to compensate for this.

January 2017

Since some of the projects I had in mind for this power supply require low voltages and none of them require precision, I decided to shoehorn the LM317 back into place. After much effort and much hot glue, I got it in place and working. This is the horrible result:



And the schematic for that horrible result:



By the way, the easy to fix problem I had with the first LM317 circuit was fixed by simply running a jumper wire across diode D1 and resistor R1 (left side of diagram), and removing capacitor C3 entirely. I also left the pull-down resistor in place just-in-case. I'm not sure if it's still

needed, but leaving it there won't cause any problems. Now the power supply works all the way down to zero volts. And yes, I do know

that the LM317 only works down to 1.2 volts. The voltage drop through the pass transistors allows the output to go all the way to zero.

While this is now a perfectly functional power supply with expanded capabilities, this article should be considered more of a "what not to do" rather than a "how to" guide. I was only successful in making this project work because I blundered through it enough times to finally land on a combination that works, and because of a running stream of good advice from a friend. This whole thing was more good luck than good management, which is also true of any of my other somewhat rare successful projects. Along the way, I destroyed an LM723 chip, blew up a 2N3055 power transistor (how do you kill one of those?!?), vaporized part of a circuit board, and learned significantly less than I had intended to. I had hoped to come away from this with a more solid understanding of voltage regulators, particularly the LM723. While I did learn some new things, I also learned that I don't yet know enough about the subject to design and build an effective voltage regulator circuit.

Maybe I can try this again some other time. The Heathkit will still be here, if it hasn't slunk away in fear yet.

As always, thanks for reading this. I'm always open to your suggestions, comments, critiques, and passive-aggressive insults. I can be reached at my call sign at hot mail dot com.

~ Adam Foley N1RKW
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Adam Foley N1RKW has been around ham radio most of his life, but didn't smarten up and get his license until 2008. Since then he has gone on to great heights (the 12' high roof of his old house, and the 3rd floor apartment he's in now), and recently decided to take up writing a monthly column about ham radio and electronics, two of the subjects he knows a little bit about (but not much). He lives in Laconia, NH with his incredibly tolerant wife and equally tolerant son and can be reached at I can be reached by email via N1RKW at hotmail dot com.



VHF Radio

John Allsopp G4YDM

How to work distant stations on Ham Radio

Radio Hams around the world have the great privilege to use part of the Very High Frequency radio spectrum to enhance their communication hobby, but how do you work long distance stations on V.H.F.? This part of the radio spectrum is by nature a line of sight band under normal weather conditions, line of sight plus about a third of the distance is the normal range, however there are conditions that do exist sporadically that offer the keen operator the fun of working many hundreds of miles.

Keep an eye on the weather forecast, sporadic E and Tropospheric ducts occur from time to time and offer good long propagation conditions. Areas of high pressure over land often contribute to this condition. Meteor shower trails left behind meteor showers help propagate what is normally a line of sight frequency over several hundred miles.

Temperature inversion over the North Sea has given me the opportunity to contact stations in Scandinavian, this type of propagation occurs during differences in temperature between the sea and the surrounding atmosphere. Coastal ducts often happen for those who are lucky enough to live by the sea, this phenomenon sometimes happen during times when the coast is bathed in thick fog.

There is a tremendous amount of loss of signal strength on V.H.F. between the transmitter and the receiver, to counteract this physical fact many operators use a directional aerial comprising a boom where a number of elements have been attached to amplify the power from not only the transmitter, a directional beam amplifies the incoming signal too. The Yagi aerial is an example of this design. Commercial radio masts erected for utility operators can easily overcome this problem by having multiple hilltop repeaters that receive the transmissions; they are then sent to other hilltops via microwave radio links

or connected together via fibre cable and the internet.

Working longer distance on V.H.F. is possible if you engage in this activity during certain organised events. Contests and other planned events including field days offer the chance for radio Hams to cover larger distances with their equipment. Many people set up their stations well away from urban areas where masts can be erected and larger beam aerials can be utilised. Linear amplifiers are used to boost the outgoing signal. Head for higher ground during these events, you will be amazed how many contacts can be made from a hilltop location.

I live in an area that is only 120 feet above ground level, not the best location for V.H.F.; however the Pennines, a mountain chain running through the middle of the United Kingdom is within easy driving distance from my home. Operating from the Pennines offer the V.H.F. Ham radio operator the benefit of height, I have operated in a particular spot on the Pennines that is over 1300 feet above sea level. Using a transportable transceiver and a homemade Yagi aerial, I have communicated with other stations well over 200 miles away under flat radio conditions. Proving that height above sea level gives the operator a great advantage.

<http://g4ydm.blogspot.co.uk/>

Article Source:

http://EzineArticles.com/expert/John_Allsopp/1925417

~ John G4YDM



January 2017



**Radio Amateurs
of
Canada**

Revised Radio Information Circular 3 Issued

*The new version of
RIC-3 can be found
online at:*

<http://www.ic.gc.ca/eic/site/smt-gst.nsf/eng/sf01008.html>

Innovation, Science and Economic Development Canada (ISED), formerly Industry Canada, has issued a revised version of RIC-3, Information on the Amateur Radio Service. It replaces RIC-3 Version 3 that was released in July 2005. Radio Amateurs of Canada welcomes the change as it addresses several long-standing issues pointed out by RAC in the past where the document required updating to address changes in technologies and practices, notably the decision by many administrations to remove the requirement for Morse code qualification for new Radio Amateurs. The new version of RIC-3 can be found online at: <http://www.ic.gc.ca/eic/site/smt-gst.nsf/eng/sf01008.html>

The new document contains several editorial changes (such as the change in the name of the Department) and clarifications regarding the operating privileges granted to holders of the Basic qualifications. Over recent years there have been questions about which qualification is required by Canadian Radio Amateurs to modify a commercial transceiver to operate on Amateur bands. Those with Advanced certification could certainly make any sort of modification as they are allowed to design and build transmitters. The new RIC-3 makes it clear that the privileges of those holding Basic certifications includes:

"re-programming of radio equipment to operate in the Amateur Bands if this can be done by a computer program. Note: No physical modifications to the circuitry of the radio are permitted."

RAC had urged that the limitation of the restriction of remote control of Amateur Radio stations to those with Advanced

qualification be relaxed as changes in transceiver design have made remote control over the Internet much simpler than in the past and so the higher technical qualification of Advanced was not essential. We believe that those with Basic should have this privilege but ISED has not yet agreed. Dealing with regulations and their interpretation is an ongoing activity where several rounds of discussion are often required to achieve results.

The document also drops the outdated requirement for visiting American Radio Amateurs to have demonstrated CW proficiency to be able to operate HF phone in Canada. The World Radiocommunication Conference of 2003 agreed that CW need not be required for Amateur Radio licensing and the USA dropped the CW requirement for Amateur Radio licences in 2007 after the previous RIC-3 was published.

The major change to the document relates to reciprocal operating privileges, in particular those provided in a European intergovernmental agreement developed through a European telecommunications committee (referred to by its French acronym CEPT) that has grown to include several non-European countries.

Canada is a signatory to the CEPT T/R 61-01 reciprocal operating agreement, under which Canadian Amateurs who have a CEPT permit issued in Canada may operate in European countries during temporary visits. This agreement has undergone various revisions over the years notably to acknowledge the removal of CW qualification as a requirement for Amateur Radio authorization in many countries,

and after negotiations between ISED and CEPT, the rules for Canadian participation have been updated to follow suit. There have been two major changes as a result:

1. There will no longer be two classes of CEPT permit depending on the holding of a Morse code qualification. Although Morse code is no longer a requirement for the CEPT permit, any such qualifications will still be noted on the permit for use in countries that still require Morse code for access to HF;
2. After conducting a comparison study of the syllabus for Canadian and CEPT examinations, CEPT has determined that only Canadian Amateurs who hold an Advanced qualification will be eligible for reciprocal operating privileges under CEPT T/R 61-01. Therefore, effective immediately, and as described in RIC-3, CEPT permits will only be issued to Amateurs with an Advanced qualification. Canadian Amateurs who have the requisite qualifications may submit requests for CEPT permits to RAC as described at: <http://wp.rac.ca/study-guides-2/regulatory-info/cept-permits/>

Canada is a party to another intergovernmental agreement, the "Inter-American Convention on an International Amateur Radio Permit" that provides reciprocal operating privileges to Radio Amateurs of one country that signs on to this agreement when they visit other countries that have also joined the agreement. At the meeting of national Amateur Radio organizations in Chile in October, Radio Amateurs of Canada and other similar organizations in our hemisphere agreed to encourage their governments to update this agreement. At last week's meeting of the Canadian Amateur Radio Advisory Board (CARAB), RAC was told that at a recent meeting of representatives of governments of the Americas, the Inter-American Telecommunication Commission (CITEL), delegates agreed to update the agreement. We expect this will be done in the summer of 2017.

Any questions regarding these changes may be directed to Richard Ferch, VE3IAY/VE3KI, RAC Regulatory Affairs Officer at regulatory@rac.ca.

~ Richard Ferch, VE3IAY/VE3KI
RAC Regulatory Affairs Officer

Amateur Radio 60M Operations Information

Most radios come with the wrong factory programmed USB frequencies for the 60m band. Check your radio. My Yaesu needed to be reprogrammed using CHIRP.

~ Art VE7WAE

HOW CAN I BE SURE I'M ON THE RIGHT FREQUENCY?

There are two concerns here. One is your suppressed carrier radio frequency and the other is your audio frequency bandwidth. There's apparently some confusion between the two as they involve using these new channels.

The channels that Industry Canada has allocated for the Amateur Radio Service are 5332, 5348, 5358.5, 5373 and 5405 kHz. These are channel-center frequencies, not the ones you'd tune your radio to unless using CW or PSK31. Amateurs "must assure that their signal is transmitted on the channel-center frequency." This means the amateur signal must be centered within the 2.8-kHz-wide channel. Amateurs should tune 1.5 kHz below the center-channel frequencies to be "on channel" using USB and Pactor III. Amateurs need to be sure that the tuning display readout reflects transmitted (ie, carrier) frequency (most do). Consult your transceiver's manual if you're not sure.

When operating SSB, upper sideband will be the convention to follow on the 60M band. Other modes that are permissible will be CW, Data (including PSK 31 and Pactor III), and RTTY.

Amateurs "must assure that their signal is transmitted on the channel-center frequency."

January 2017

Channel Center	Amateur CARRIER Tuning Frequency
5332 kHz	5330.5 kHz
5348 kHz	5346.5 kHz
5358.5 kHz	5357.0kHz
5373 kHz	5371.5 kHz
5405 kHz	5403.5 kHz It is important to note that the frequencies shown above in the green area of this chart are <i>suppressed carrier frequencies</i> – the frequencies that appear in your transceiver's tuning display when your transceiver is in the USB mode.

MAXIMUM ALLOWED POWER IS 100W ERP (EFFECTIVE RADIATED POWER)

Industry Canada allows 100w of power being radiated from the antenna not the transceiver itself. In other words if your antenna generates any gain, this must be factored in so you do not exceed the maximum power limit.

Enjoy the new frequencies in 60m, RAC worked hard and was instrumental in allowing Industry Canada to approve this new spectrum to Canadian amateur radio operators.

60 Meter Amateur Radio Band Channels as of January 22, 2014

Each channel having an effective bandwidth of 2.8 kHz

Ham Radio software company alleged to have blacklisted users for leaving negative reviews

The Register reports on the story of Jim Giercyk, an amateur radio enthusiast who, it is alleged, had his copy of the popular **Ham Radio Deluxe** (HRD) software revoked after posting a negative review.

Other radio hams have followed up regarding claims that this was not an isolated incident and others may have had their license keys blacklisted for being publicly critical of the company. And just to be clear: by blackballing keys, installed copies of the software stop working.

Giercyk, a professional musician in South Carolina, U.S., says that after his dealings with HRD Software (which has since reinstated his software key) and the statement made by the developer's co-owner Dr Michael Carper, he takes issue with claims made by the company. Giercyk, aka N2SUB, told us on Tuesday: "The issue is not the refusal of service, the issue is that HRD disabled my software, and then offered to enable it in exchange for the removal of an online review of their product. It's extortion, not refusal of service."

Giercyk also said that since he went public about his blacklisting last week, he has received messages from

other users who have stories of their software keys being revoked by HRD without their knowledge for speaking up about having a bad support experience. A number of other readers pointed out a collection of bad reviews posted on hobbyist site eHam by customers who had their license keys blacklisted. HRD told us some of those users could have written their assessments after requesting a refund and deactivating their software, thus their licenses will appear revoked.

Meanwhile, Reddit threads and follow-up discussions to Giercyk's catalyst forum post reveal similar stories of keys being revoked after critical comments about Ham Radio Deluxe have appeared online. Other sources allege some amateur radio forums have in the past deleted posts critical of HRD.


http://www.theregister.co.uk/2016/12/21/amateur_radio_fans_drop_hammer_on_hrds_blacklist/

<http://www.eham.net/reviews/review/143372>

<https://www.qrz.com/db/N2SUB>

<http://forums.qrz.com/index.php?threads/ham-radio-deluxe-support-hacked-my-computer.547962/>

January 2017

Sun	Mon	Tue	Wed	Thu	Fri	Sat
	2	3 1930 SEPAR Net 2000 SARC Net	4	5 1930 SEPAR Simplex Check-in	6	7 0900 Klub Koffee Klatch: Kalmar Family Restaurant, King George Blvd & 81 st Ave. CONTEST: ARRL RTTY Roundup
8 CONTEST: ARRL RTTY Roundup	9	10 1930 SEPAR Net 2000 SARC Net	11 1900 SARC General Meeting	12 1930 SEPAR Simplex Check-in	13	14 0900 Klub Koffee Klatch: Kalmar Family Restaurant CONTEST: NA QSO Party CW
15 CONTEST: NA QSO Party CW	16	17 1930 SEPAR Net 2000 SARC Net	18	19 1930 SEPAR Simplex Check-in	20	21 0900 Klub Koffee Klatch: Kalmar Family Restaurant CONTEST: NA QSO Party SSB
22 CONTEST: NA QSO Party SSB	23	24 1930 SEPAR Net 2000 SARC Net	25 SARC Exec Meeting	26	27	28 0900 Klub Koffee Klatch: Kalmar Family Restaurant CONTEST: BARTG RTTY Sprint
29 CONTEST: BARTG RTTY Sprint	30	31 1930 SEPAR Net 2000 SARC Net	<div> <p>For details on all SARC events, go to ve7sar.net</p> <p>For details on all SEPARS events, go to separ.shutterfly.com/calendar</p> </div>			

January 2017

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QRT

John Schouten VE7TI

New Year's Resolutions

The New Year has arrived and Hams, like so many others, may have a few resolutions to consider. I think we all recognize that the hobby is going through change. While the number of licensed Amateurs in North America continues to increase, likely due in large part to the ease with which a license exam can be passed, the number of 'active' hams seems to be diminishing. One only has to monitor a repeater or tune in to a weekly net to realize that participation has dwindled. With this in mind, I offer a list of amateur radio new year's resolutions and encourage you to try to adopt some or all with your own goals for 2017.

On the west coast we hear about the impending '300-year' earthquake frequently and have regular drills to prepare, including checking into an emergency net. That earthquake could happen tomorrow or at some point past our lifetime—despite some believable scientific data, no one knows for sure. But there are more common calamities that could happen sooner, and have over the past few years. A major snow or wind storm... an extended power outage.

It is a good idea to make preparations now without the stress of a fast approaching deadline. If you are thinking of replacing or building an antenna for use in an emergency, now is the time to build it and test it out at a leisurely pace. We have in the past, and will continue to present, home built antenna projects in this publication. If you're not that handy, ask about the antenna workshop we offer to all our Basic course students. We also have a cadre of willing 'Elmers' who will help you with advice and assistance to set up that antenna.

Another aspect of Amateur Radio that comes into focus now is contest season. There is a contest every weekend in January, just check the calendar on page 31. SARC has a contest group with tutors, and we invite your participation. Even if you only have a passing interest in

contesting, come and try it at least once. Emergency focused radio operators will find contesting has many of the same challenges, and you *will* improve your skills, thereby becoming a better communicator.

Have a go at operating away from your usual location. It has been dubbed "Ham Radio Alfresco." There are so many hills, parks and beaches in our area that if you can't find a place to throw a little wire in a tree and operate with low power off a battery, you aren't looking hard enough. Your "portable" station can be anything from a handheld or QRP single band rig to one of the big three's latest 100 watt wonder radios that do everything from DC to Daylight. Just turn the power down so the battery lasts more than 10 minutes and you too can add another few 'Qs' to your logbook.

If you are thinking about trying to upgrade your license, now is the time to start studying. If your storage shed has a ton of old radio stuff in it, get busy and drag it all out into the sunlight and sort it out or throw it out. If you find you have a working radio or accessory that you do not need any more, consider donating it to your local Amateur Radio group.

Come to a monthly meeting. You will find interesting presentations, lots of information and friendly fellow SARC members.

And lastly, please make an effort to use our repeaters once in a while. It would be very encouraging to hear some conversation outside of net night but, speaking of our net, please check in there too, we meet every Tuesday at 8pm 147.360 MHz (+600 KHz) Tone=110.9, or via Echolink.

73, and Happy New Year!

~ John VE7TI

Communicator Editor



It's January!

At our meeting on January 11th we look forward to Stan Williams' software defined radio (SDR) presentation, Part 2 and an SDR demo. Sheldon Ward will review the Club items for sale and demonstrate his experiences with the WSPR project.

Down The Log...

SARC Monthly Meetings

2nd Wed. (Sept-Jun)
1900 hr at the PREOC
Emergency Mgmt BC
14275 96th Avenue,
Surrey, BC

Weekly Club Breakfast

Saturday at 0900 hr
Kalmar Family Restaurant
8076 King George Blvd.
Surrey

SARC Net

Tuesday at 2000 hr local
on 147.360 MHz (+)
Tone=110.9

SEPARS Net

Tuesday at 1930 hr local
on 147.360 MHz (+)
Tone=110.9

VE7RSC Repeaters

2m: 147.360MHz+
Tone= 110.9Hz
IRLP node 1736
Echolink node 496228

1.2m: 223.960 Mhz -1.6
Tone=110.9

70cm: 443.775MHz+
Tone= 110.9Hz
IRLP node 1737

SARC hosts an Amateur Radio net each Tuesday evening at 8 PM. Please tune in to the VE7RSC repeater at 147.360 MHz (+600 KHz) Tone=110.9, also accessible on IRLP node 1736 and Echolink node 496228.

On UHF we operate a repeater on 443.775MHz (+5Mhz) Tone=110.9 or IRLP Node 1737.

	SARC Net 20:00 Hrs
1 st Tuesday Standby	Drew VA7DRW Rob VE7CZV
2 nd Tuesday Standby	Jinty VA7JMR Sheldon VA7XNL
3 rd Tuesday Standby	Rob VE7CZV Vacant
4 th Tuesday Standby	Kapila VE7KGK John VA7XB
5 th Tuesday Standby	Robert VA7FMR Rob VE7CZV
Want a turn at Net Control? Contact the SARC Net Manager	



We Have A SARC Patch!

These are suitable for sewing on a jacket, cap or your jammies, so you can proudly display your support for the club.

The price is \$4 each or three for \$10 and they can be picked up at a meeting or the weekly Koffee Klatch.

Burnaby Radio Communications

Michael J. Wong VE7HMW
President/Owner

Commercial / Amateur Radio

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